

NOTES AND NEWS.

DR. H. MOLISCH has been called to the German University at Prag as professor of anatomy and physiology of plants and director of the physiological institute.

THE DEPARTMENT OF AGRICULTURE has issued a bulletin on "nut grass" (*Cyperus rotundus*), regarding which Mr. Dewey, assistant botanist, desires information.

THE ACADEMY OF SCIENCES at Berlin has appropriated 500 marks for the prosecution of the work of the International Commission for the reform of botanical nomenclature.

DR. EDWARD PALMER has gone to Acapulco, Mexico, where he expects to make a collection of plants. He goes at his own expense, but his plants will be named as heretofore by Mr. J. N. Rose of the Department of Agriculture.

IN THE *American Naturalist* (August) Professor L. H. Bailey publishes a paper on "Neo-Lamarckism and Neo-Darwinism," in which these varying schools are defined, and exceptions taken to Weismann's theory of the continuity of the germ-plasm, as well as his sweeping claims concerning acquired characters.

IN THE *Zeitschrift für Pflanzenkrankheiten* 4: 5. 1894, Jacob Eriksson and Ernst Henning describe a new Puccinia (*P. dispersa* Eriks. & Henn.), from Sweden. The æcidium stage is found upon two species of *Anchusa*. The uredo and puccinia stages occur on at least eleven species of Gramineæ, including several of the cereals.—L. S. C.

DR. HARSHBERGER'S note (p. 159) concerning *Ranunculus acris* L. as being poisonous tells an old story. In many places, beggars used to rub their hands with this plant, in order to make them sore and thus obtain alms. For this reason the Danish name of the plant is Tigger-Ranunkel (beggarr-r.). The *Kräuterbücher* and old floras know a great deal about this plant.—J. C. BAY.

IN THE October number of *Forstlich-naturwissenschaftliche Zeitschrift* appears the concluding part of "Contributions to the history of development of buds in some deciduous trees," by Dr. Paul Albert; "Investigation of the morphology and anatomy of malformations upon shoots and leaves caused by the Exoasci," by W. G. Smith; and "The capacity of oak stumps for budding, and their infection by *Agaricus melleus*," by Dr. Robert Hartig.

MESSRS. Frank S. Collins, William A. Setchell, and Isaac Holden have made preparations for the issuing of sets of dried specimens of the North American algæ, both of the fresh and of the salt waters, for the aid of investigators, and to assist in the development of a better knowledge of the North American species. Contributions of sets of eighty specimens each are solicited. All interested are requested to address Frank S. Collins, 97 Dexter St., Malden, Mass.

THE BELGIAN ACADEMY of Sciences at Brussels has offered prizes to the value of 600 francs for the best treatise on the following themes:

(1) Researches on the number of chromosomes before fertilization in any animal or plant; (2) New researches on the quaternary flora (of Belgium) and especially on the peat bogs; (3) Is there a nucleus in the schizophytes, and if so, what is its structure and the mode of division? Theses must be written in French or Flemish and sent under a fictitious name before August 1st, 1895, to Chev. Edm. Marchal, secretary of the Academy.

M. JULES FERDINAND LUND has found¹ that the age of tubers influenced the effect of dessication upon their respiration. In old tubers collected in the preceding season which had been kept over winter, he found that respiration diminished with the diminution of the water; but when he operated with young tubers collected in April or in May and formed during the season, he found respiration augmented by a rather feeble loss of water.

Dr. J. GRÜSS of Berlin publishes an extensive paper in Pringsheim's *Jahrbücher f. wiss. Botanik* (26: 379-437. 1894) on the behavior of the diastatic enzymes in seedlings. He holds, in brief, that diastase (or a certain sort of it) behaves in germination in the same way as the sugar, passing from cell to cell as needed. In growing tissues it behaves somewhat differently, for it is stored up there, and is probably used for the solution of the transverse walls in the formation of the tracheæ. Grüss holds it as certain that diastase belongs to the bodies capable of diffusion.

M. LUCIEN DANIEL has been making a thorough study of herbaceous grafting. He has not only studied the subject from the morphological and physiological point of view² but now suggests³ a series of principles for the practical application of herbaceous grafting. He finds it possible to vary the flavor of legumes by grafting on a plant having a different flavor; to retard the flowering of crucifers (and so to avoid hybridization by insects, etc., when it is desired to keep varieties pure); and to create new varieties by grafting after seed formation. He has not been able to graft etiolated herbaceous plants.

THE CAUSES of the arrangement of leaves has long been one of the problems for study of physiologists and many contributions has been made to the subject. Dr. Hermann Vöchting publishes in Pringsheim's *Jahrbücher f. wiss. Botanik* (26: 438-494. 1894) a paper on the effect of light in determining the form of the leaf-like Cactaceæ, which he concludes by a discussion of the theory of leaf arrangement. He was able to modify at will the form of these plants, not only altering the leaf arrangement but even the stem structure from isobilateral to radial. The genus chiefly used, *Phyllocactus*, Vöchting believes to be a very modern one, and the changes induced in it by altering the light to be artificial reversion. In these leaf-like Cactaceæ, therefore, he concludes that leaf arrangement is due to the influence of light upon

¹ Revue Gén. de Bot. 6: 353. 15 S 1894.

² Recherches morphologiques et physiologiques sur la greffe. Rev. Gén. de Bot. 6: 1894.

³ Sur quelques applications pratiques de la greffe herbacée. Rev. Gén. de Bot. 6: 356. 15 S 1894.

the growing point. It is not a phenomenon of secondary growth. It may be that in other plants other external agents, notably gravity, produce an effect, and he promises investigation of this and similar questions.

THE FILSON CLUB of Louisville, Ky., has in press for publication in January "The life and writings of Constantine Samuel Rafinesque" by Dr. R. Ellsworth Call. The memoir had its inception in an attempt to clear up certain matters connected with the synonymy of the *Unionida*. A number of very remarkable facts connected with the personality of its subject were thus incidentally learned and the author became convinced that Rafinesque had not been always fairly treated by his contemporaries, and that many naturalists now living had formed opinions concerning the nature and value of Rafinesque's work which are quite erroneous. The volume will be in the sumptuous quarto form adopted by the Filson Club, the edition limited to five hundred copies, and issued in paper only. It will contain several full-page illustrations, one of which will be a portrait of its subject. A complete bibliography of the writings of Rafinesque, on every subject, comprising over four hundred titles, will be included.

VERY CONSIDERABLE changes and advances are being made in the department of botany at Smith College. Two years ago a new botanic garden was founded on the college grounds which were laid out for the purpose by Messrs. Olmsted and Elliot. One portion of the grounds is occupied by the herbaceous garden and green house while the remainder, including the campus, is being planted with trees and shrubs grouped principally in their natural orders, but at the same time with regard to artistic landscape effects. The attempt is therefore being made to combine as far as possible the ornamentation of the grounds and buildings with a natural botanical arrangement. The department has been further strengthened by the establishment of a new professorship, to which Dr. William F. Ganong, formerly instructor in botany in Harvard University and lately a student with Goebel at Munich, has been appointed. The former instructor in botany, Miss Grace D. Chester, has been made instructor in cryptogamic botany. The laboratories have been liberally equipped with additional apparatus, and new courses, including graduate work, are being offered.

DR. MORITZ TRAUBE, one of the many genial naturalists who lived and worked at Breslau, Germany, died on the 28th of June. Traube was born at Ratibor and studied at the University of Berlin. His brother, Ludwig Traube the distinguished clinic, was engaged in medical researches when the younger brother arrived at Berlin; when the latter had been made doctor, he worked on the question of diabetes mellitus, mainly from the chemical point of view. But his life's great work was that on the organization of the cell, and on the processes of fermentation and putrefaction. In this connection, we recall his *Theorie der Fermentwirkungen* (1858), his *Experimente zur Theorie der Zellbildung und Endosmose* in Reichert's and Du Bois Reymond's *Archiv.* —: 87. 1867, and his many valuable papers in the *Berichte der deutschen chemischen Gesellschaft*, 1874, 1876, and later. His work on

the production of oxygen by the organism caused a long and most interesting literary debate between him and Hoppe-Seyler. Traube was unable to devote more than a part of his time to investigations, because he conducted the wine business started many years ago by his father at Ratibor. During the last years of his life, Traube lived in Berlin. Since 1886 he has been member of the Berlin Academy of Sciences. His name will long be remembered in cellular physiology.

—BAY.

AS A SEQUEL to his investigations on the origin of the haustoria of *Cuscuta* and their penetration of host plants, Mr. G. J. Pierce has sought to discover whether common roots have the power to penetrate living tissues.¹ By enclosing seeds of *Brassica napus* and *Sinapis alba* between halved potato tubers he found the roots able in twelve days to penetrate the half and even to pass out through the cork layer. On such roots, as on those grown in plaster casts, no hairs develop, which is probably due to the resistance of the medium. The passage made by the root was surrounded by torn, compressed, dead, brown-walled cells, which were enclosed by two or three rows of cells forming new walls parallel to the course of the wound. He found no corroded starch grains, à propos of which he remarks that the observations of Prunet on the penetration of potato tubers by rhizomes of *Cynodon Dactylon* may be explained on other grounds than the excretion of a diastatic ferment. Similar results were obtained with the thicker roots of *Pisum* and *Vicia Faba*. In three days the pea roots had penetrated 7.5^{mm} without any corrosion of starch. These and other experiments seem to show that the penetration was due to mechanical pressure exerted. Seedlings of the pea were cemented to branches of *Impatiens Sultani*, a leaf of *Echeveria* sp., an almost ripe ovary of *Fritillaria*, a petiole of *Rheum officinale*, a leaf of *Aloe*, and a stem of *Euphorbia lucida*. In all these cases the roots penetrated the superficial tissues to the inner. So the ability and the force needed to penetrate living tissues is not peculiar to the specialized roots of *Cuscuta*, but is possessed by ordinary plants.

PFEFFER HAS demonstrated that it is the root alone which possesses geotropic sensitiveness. "All previous investigations have been inconclusive because they were judged of by the results which followed cutting off the tip of the root. . . . As regards heliotropism the state of things is easily demonstrated, since the rays of light that act as a stimulus can be easily directed to a single point. On the other hand, it can hardly be thought practicable to expose the root tip alone to the stimulus of gravitation, or in place of this to centrifugal force. We attained the end in another way, however, namely, by compelling the tip of a root, whilst growing quite normally, to take up permanently a position at right angles to the rest. For this purpose we allowed roots of *Faba*, *Lupinus*, etc., to grow into short tubes of thin glass that were bent at a right angle. The advancing root easily follows the bend of the tube, and pushes on as far as the other end which has been closed by heat. . . . A geotropic reaction only follows when the tip of the root is not placed in the position of equilibrium, that is, when it is inclined from the vertical. But if the tip is directed

¹Botanische Zeitung 52: 169. 1894.

vertically downwards, the rest of the root may occupy the horizontal or any other position, without the geotropic reaction following. By this means, therefore, it is proved with the most perfect certainty that in an uninjured root only the root tip is geotropically sensitive."¹

"A THEORY of the strobilus in archegoniate plants" is the title of a most suggestive paper read by Dr. F. O. Bower before section D of the B. A. A. S., and published in the *Annals of Botany* 8: 343-365. S 1894. It ought to be read in full by every botanist who is interested in the questions of vegetable phylogeny. The main points of the theory are briefly stated by the author in these words:

1. Spore production was the first office of the sporophyte, and the spore phase has constantly recurred throughout the descent of the Archegoniatae; the spore bearing tissues are to be regarded as primary, the vegetative tissues as secondary, in point of evolutionary history.

2. Other things being equal, increase in number of carpospores is an advantage; a climax of numerical spore production was attained in the vascular cryptogams.

3. Sterilization of potential sporogenous tissue has been a widespread phenomenon, appearing as a natural consequence of increased spore production.

4. Isolated sterile cells, or layers of cells (tapetum), served in many cases the direct function of nourishing the developing spores, being themselves absorbed during the process.

5. By formation of a central mass (columella, etc.) the spore production was, in more complex forms, relegated to a more superficial position.

6. In vascular plants, parts of the sterile tissue formed septa, partitioning off the remaining sporogenous tissue into separate loculi.

7. Septation to form synangia, and the subsequent separation of the sporangia, are phenomena illustrated in the upward development of the vascular plants.

8. Such septation may have taken place repeatedly in the same line of descent.

9. The strobilus as a whole is the correlative of a body of the nature of a sporogonial head, and the apex of the one corresponds to the apex of the other.

10. Progression from the simpler to the more complex type depended upon (a) septation, and (b) eruption to form superficial appendicular organs (sporangiophores, sporophylls), upon which the sporangia are supported.

11. By continued apical growth of the strobilus the number of sporophylls may be indefinitely increased.

12. The sporophylls are susceptible of great increase in size and complexity of form; in point of evolutionary history, small and simple sporophylls preceded large and complex ones.

13. In certain cases foliage leaves were produced by sterilization of sporophylls.

¹Annals of Botany, 8: 317. S. 1894.